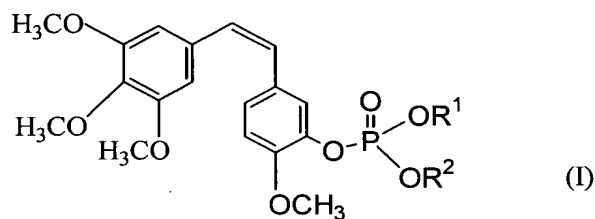


WHAT IS CLAIMED IS:

1. A compound having the structure of formula I:



wherein:

one of  $-OR^1$  or  $-OR^2$  is  $-O^+QH^+$ , and the other is hydroxyl or  $-O^+QH^+$ ; and

Q is

- (A) an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $QH^+$ ;
  - (B) an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$ ; or
  - (C) an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.
2. The compound of claim 1, wherein Q is an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $QH^+$ .
3. The compound of Claim 2, wherein the nitrogen of Q forming the quaternary ammonium cation  $QH^+$  in the formula I is a primary amine bonded to an optionally substituted aliphatic group or a secondary amine bonded to two optionally substituted aliphatic groups, wherein the optional substituents are one or more hydroxyl or amino groups.
4. The compound of Claim 2, wherein Q is an optionally substituted aliphatic organic amine selected from the group consisting of ethanolamine, diethanolamine, ethylenediamine, diethylamine, triethanolamine, glucamine, N-methylglucamine,

ethylenediamine, 2-(4-imidazolyl) ethyl amine, choline, and hydrabamine and stereoisomers thereof.

5. The compound of Claim 1, wherein Q is an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ .

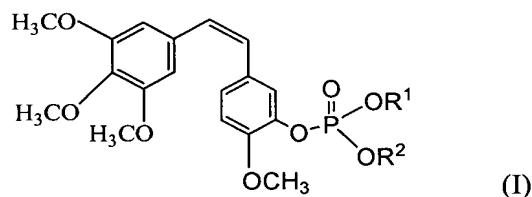
6. The compound of Claim 5, wherein said amino acid is selected from the group consisting of lysine, tryptophan, arginine, ornithine, proline, glutamine, asparagine, hydroxyproline and stereoisomers thereof.

7. The compound of Claim 1, wherein Q is an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

8. The compound of Claim 7, wherein Q is a glycine  $\text{C}_{1-6}$  alkyl ester.

9. A pharmaceutical composition comprising:

(a) a compound having the structure of formula I:



wherein:

one of  $-\text{OR}^1$  or  $-\text{OR}^2$  is  $-\text{O}^-\text{QH}^+$ , and the other is hydroxyl or  $-\text{O}^-\text{QH}^+$ ; and

Q is

(A) an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ;

(B) an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ; or

(C) an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$  and

where, further, all carboxylic acid groups of the amino acid are in the form of esters; and

(b) a pharmaceutically acceptable carrier thereof.

10. The pharmaceutical composition of Claim 9, wherein Q is an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $QH^+$ .

11. The pharmaceutical composition of Claim 9, wherein said optionally substituted aliphatic organic amine is selected from the group consisting of ethanolamine, diethanolamine, ethylenediamine, diethylamine, triethanolamine, glucamine, N-methylglucamine, ethylenediamine, 2-(4-imidazolyl) ethyl amine, choline, hydrabamine and stereoisomers thereof.

12. The pharmaceutical composition of claim 11, wherein the pH is adjusted by an agent other than sodium hydroxide.

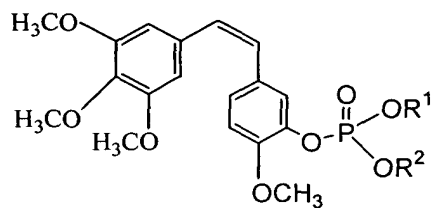
13. The pharmaceutical composition of Claim 9, wherein Q is an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$ .

14. The pharmaceutical composition of Claim 9, wherein said amino acid is selected from the group consisting of lysine, tryptophan, arginine, ornithine, proline, glutamine, asparagine, hydroxyproline and stereoisomers thereof.

15. The pharmaceutical composition of Claim 9, wherein Q is an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

16. The pharmaceutical composition of Claim 9, wherein Q is a glycine  $C_{1-6}$  alkyl ester.

17. A method of modulating tumor growth or metastasis in an animal comprising the administration of an amount effective therefor of a compound having the structure of formula I:



wherein:

one of  $-OR^1$  or  $-OR^2$  is  $-O^-QH^+$ , and the other is hydroxyl or  $-O^-QH^+$ ; and

Q is

- (A) an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $QH^+$ ;
- (B) an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$ ; or
- (C) an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

18. The method of Claim 17, wherein Q is an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $QH^+$ .

19. The method of Claim 18, wherein the nitrogen of  $QH^+$  forming the quaternary ammonium cation  $QH^+$  in the formula I is a primary amine bonded to an optionally substituted aliphatic group or a secondary amine bonded to two optionally substituted aliphatic groups, wherein the optional substituents are one or more hydroxyl or amino groups.

20. The method of Claim 18 wherein said optionally substituted aliphatic organic amine is selected from the group consisting of ethanolamine, diethanolamine, ethylenediamine, diethylamine, triethanolamine, glucamine, N-methylglucamine, ethylenediamine, 2-(4-imidazolyl) ethyl amine, choline, hydrabamine and stereoisomers thereof.

21. The method of Claim 18, wherein Q is an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $QH^+$ .

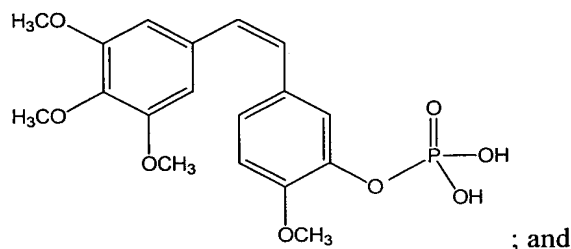
22. The method of Claim 18, wherein said amino acid is selected from the group consisting of lysine, tryptophan, arginine, ornithine, proline, glutamine, asparagine, hydroxyproline, and stereoisomers thereof.

23. The method of Claim 18, wherein Q is an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

24. The method of Claim 18, wherein Q is a glycine  $\text{C}_{1-6}$  alkyl ester.

25. A composition formed by mixing compounds comprising:

(a) a CA4P free acid having the structure:

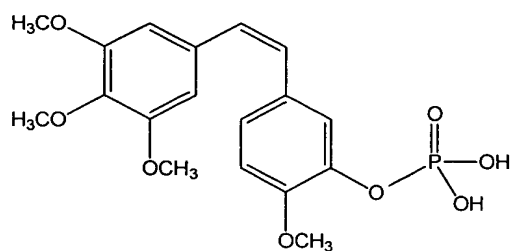


(b) compound Q, wherein Q is

- (A) an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ;
- (B) an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ; or
- (C) an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

26. The composition of claim 25 further comprising a pharmaceutically acceptable carrier.

27. A process for preparing a compound of Claim 1, comprising the step of contacting, in a solvent, CA4P free acid having the structure:



with compound Q, wherein Q is

- (A) an optionally substituted aliphatic organic amine containing at least one nitrogen atom which, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ;
- (B) an amino acid containing at least two nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$ ; or
- (C) an amino acid containing one or more nitrogen atoms where one of the nitrogen atoms, together with a proton, forms a quaternary ammonium cation  $\text{QH}^+$  and where, further, all carboxylic acid groups of the amino acid are in the form of esters.

28. The process of Claim 27, wherein said compound of Claim 1 is precipitated in crystalline form from said solvent.